

HABITS OF SOUTH AMERICAN EQUATORIAL BUTTERFLIES

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In the rather extensive literature of South American Lepidoptera, there is little discussion of the idiosyncracies of various species of butterflies, such as their postures, methods of flight, actions when pursued, and preferred habitats. It is the copious treatment of this phase of the subject which lends so much interest to the works of W. H. Edwards, Scudder and other writers on North American butterflies. Various monographers in Seitz's "Macrolepidoptera" comment on the habits of certain insects, but many of the statements are evidently based on casual observations within a limited area.

The impressions presented in this paper have been gained from field work in the vicinity of Para, Brazil, Iquitos, Peru, and various localities in British Guiana. I have received much information from Rev. A. Miles Moss, who for nearly twenty years has collected and studied the Lepidoptera of Para, and who has made several valuable contributions to "Novitates Zoologicae"; also from Miss Margaret E. Fountaine, an English entomologist who has devoted many years to the breeding of butterflies in nearly all parts of the world. To both of these I wish to tender appreciative thanks.

A collector visiting the tropics for the first time will notice at once a number of differences between the insects he encounters and those with which he is familiar at home. He will first of all be impressed with the abundance of species as contrasted with the paucity of individuals. This phase of tropical butterfly life was fully discussed by Bates and Wallace, and has been emphasized by many later authors. Chief among the various factors which have combined to originate a large number of species is the wealth of tropical vegetation, which at the equator includes a variety of food plants distributed over so vast an area that the individuals of a given form must perforce have a wide range. One does not observe well marked plant societies comparable to

our alder swamps, pine groves, birch woodlands or scrub oak barrens, each supporting a distinct insect fauna. On the other hand an acre of jungle may include fifty or more trees and shrubs and innumerable epiphytes and herbaceous plants. As a natural result of this condition, the butterflies of unrelated families have often adopted similar habits, a tendency increased by the number of enemies with which they have to contend in all stages of their existence.

Climatic factors also affect the habits to a marked degree. The strictly sun-loving species are fewer than in temperate regions, and at midday only the swift *Catopsilias*, some skippers, and the common *Anartias* are to be seen on the wing in open fields or clearings. Other butterflies must be sought in or near the forest, where they are less subject to the attacks of lizards, and where they may be protected from torrential downpours of rain. It is therefore evident that the collector cannot as a rule go forth in the expectation of finding a desired insect in any particular habitat. This seems strange to any one who has hunted butterflies in our northeastern states and knows that he must look for certain forms in meadows and pastures while others must be sought along a tree-bordered road. Many of our temperate species are distinctly local in habitat, being confined to the locality in which their food plants occur, as for example *Epidemia epixanthe* in cranberry bogs, or *Euphydryas phaeton* in swampy meadows containing the turtlehead (*Chelone glabra*). But one may stroll along an equatorial jungle path and encounter within a short distance representatives of almost every family.

Narrow trails through the forest usually afford the best collecting in the tropics, as the insects appear to be suspicious of a broad road, especially where the shrubbery has been cut away. This is probably because lizards abound in clearings, and judging from the many individuals I have seen with symmetrical bites taken out of the hind wings, it may be inferred that these, together with certain insectivorous birds, are the principal enemies of the imago. This assumption is strengthened by the fact that very few butterflies except *Prepona*, *Ageronia* and *Gynæcia* habitually alight on tree trunks, and practically none

on the ground except along water courses in the dry season. The favorite perch is on a leaf at the tip of a branch, most erylids and some hesperids preferring the under side. The *Ageronias* sit on a tree trunk head downward with expanded wings, the upper surface of which is always protectively colored; the *Preponas*, on the other hand, repose with erect wings, concealing the brilliant blue patches of the upper surface. The geotropic pose is doubtless to guard against an enemy crawling up the trunk, but even the active *Prepona* does not always escape the agile lizard.

Large spiders having their lairs within coiled leaves, and others lurking among flower clusters, prey upon butterflies, while predacious ants, dragon flies and robber flies are everywhere abundant. It is not surprising, therefore, that tropical butterflies, even among the protected groups, are far more timid than those of temperate regions, dashing away at the first movement of the net. They are adepts in the art of dodging, and nearly all species have developed an erratic flight. This is especially true of the *Satyridae* and the clearwinged *ithomiids*, which zigzag close to the ground in the depths of the forest, alighting frequently but instantly arising. *Lycaenids* and *erylids* weave in and out of the bushes with so swift and irregular a flight that it is difficult for the eye to follow them; and some members of the latter family have the curious habit of landing on the upper surface of a leaf and immediately running around beneath it. Some skippers imitate the *erylids* in habit, while others dart to and fro in the forest after the manner of dragon flies, often returning to the same perch. The only groups that consistently exhibit a straight and rather slow flight are the *Heliconiidae* and *Papilios* of the *Aristolochia* group, both of which are protected by their odor from most of their natural enemies. When disturbed, however, the *heliconids* fly aloft among the trees, while the *papilios* dive into the forest where no net can reach them.

This similarity of flight among unrelated families is very characteristic of the tropics. Until its capture one is never certain whether a small butterfly is a *Thecla*, an *erylid*, a *hesperid* or a *nymphalid*. The day flying moth *Urania* is practically undistinguishable from a *Papilio*; and certain *Satyridae* dart about like *lycaenids*.

The Morphos have a graceful, undulating flight, coursing up and down the forest lanes or along tree bordered creeks. They are always attracted by anything of their own color, as a blue ribbon or even a blue dress; but it requires a deft pass and a supple wrist to secure one on the wing. Like their crepuscular relatives, the Caligos, they are readily attracted to a bait of fruit soaked in beer or rum, and sometimes become so sluggish from over-indulgence that they may be picked off with the fingers. A number of nymphalids may also be taken at bait, but they are as a rule much more wary.

A remarkable case of protective coloration enhanced by instinctive habit came to my attention at Wismar, in British Guiana. I noticed occasional flashes of brilliant blue among the shrubs bordering a clearing, too small to be produced by any Morpho. On capturing the insect I found it to be one of the larger species of *Thecla*,* having wings of an intense sapphire blue above, the under surface being ashen gray, marbled with brown. Similar contrasts between the two surfaces are, of course, common in members of this genus. But the butterfly in question has adopted the habit of taking wing with a quick dart and almost immediately alighting, when its closed wings render it practically invisible. This maneuver is repeated as often as it is disturbed so that the conspicuous coloration is exhibited to the smallest possible extent.

This is but one of the many remarkable protective adaptations which are to be observed everywhere among tropical insects, the study of which adds zest to collecting, and repays the student for all the discomforts and vicissitudes of the chase.

* *Thecla damo*.